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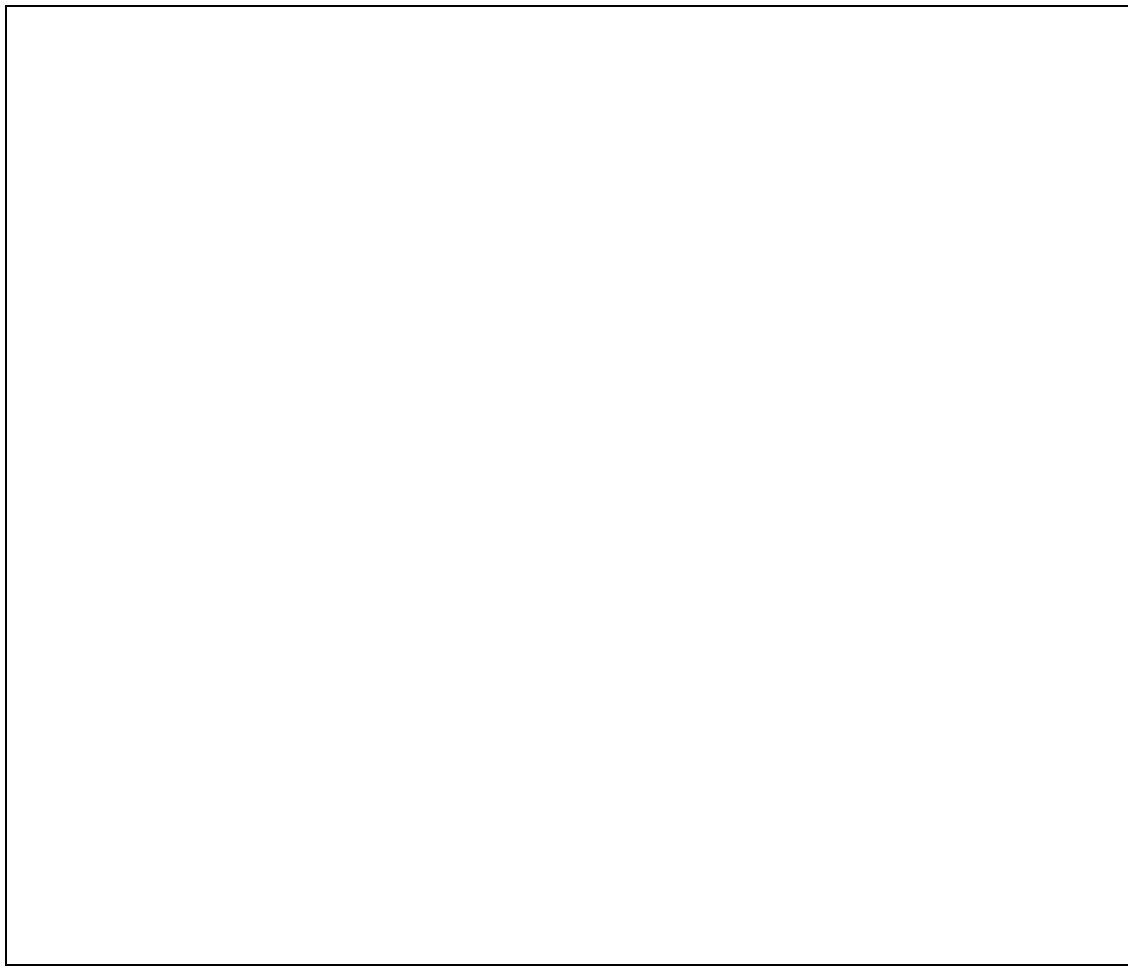
DEVELOPMENT CONCEPT PLAN/ ENVIRONMENTAL ASSESSMENT

PU`UHONUA O HONAUNAU NATIONAL HISTORICAL PARK

Honaunau, Hawai`i

July 2000



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SUMMARY

Built as "temporary" facilities more than four decades ago, structures housing the administrative headquarters and maintenance facilities for Pu`uhonua o Honaunau National Historical Park are located in an area of the park where significant Hawaiian archeological features are now known to exist. In some cases, these non-historic structures lie directly on top of cultural resources. In their present location, they are a visual intrusion on the cultural landscape of a historically significant portion of the park. Moreover, the structures are in a coastal area subject to high waves generated by severe winter storms or hurricanes and inundation from tsunami (tidal waves).

The purpose of this development concept plan is to remove these intrusive developments from their present location, construct new replacement facilities in suitable locations elsewhere in the park and provide direction for the re-establishment of the historic scene in the former location. Alternative sites have been considered for the construction of replacement facilities, including locations outside of the park. The plan also calls for the replacement of portable chemical toilets with a permanent comfort station. The portable chemical toilets do not comply with Director's Order #83, Public Health, and are located in an area susceptible to damage from storm waves.

Alternative sites for the new replacement facilities were analyzed based on their effect on park resources, improvements to park operations and their effect on the visitor experience. New facilities would be located and designed to harmonize with the park's cultural landscape and in accord with sustainable planning and design guidelines.

The proposed action consists of constructing a new headquarters building near the existing visitor parking lot, new maintenance facilities in a mauka portion of the park and a new comfort station near the picnic area. These developments would all replace existing substandard and inadequate facilities. Preliminary conceptual cost estimates have been developed for the planning, design and construction of the proposed new facilities and for the restoration of the historic scene. As part of environmental compliance documentation, an environmental assessment has been prepared to analyze effects of the proposed action and the no action alternative on park resources. Based on this analysis, the proposed action is the environmentally preferred alternative. Moreover, it appears that the proposed developments would not significantly impact the cultural and natural resources of the park.

PURPOSE AND NEED FOR THE PLAN

PARK PURPOSE

The purpose of Pu`uhonua o Honaunau National Historical Park is to preserve, protect and interpret the significant Hawaiian archeological sites found within the park and to provide visitors with an understanding and appreciation of the Hawaiian cultural values associated with these sites.

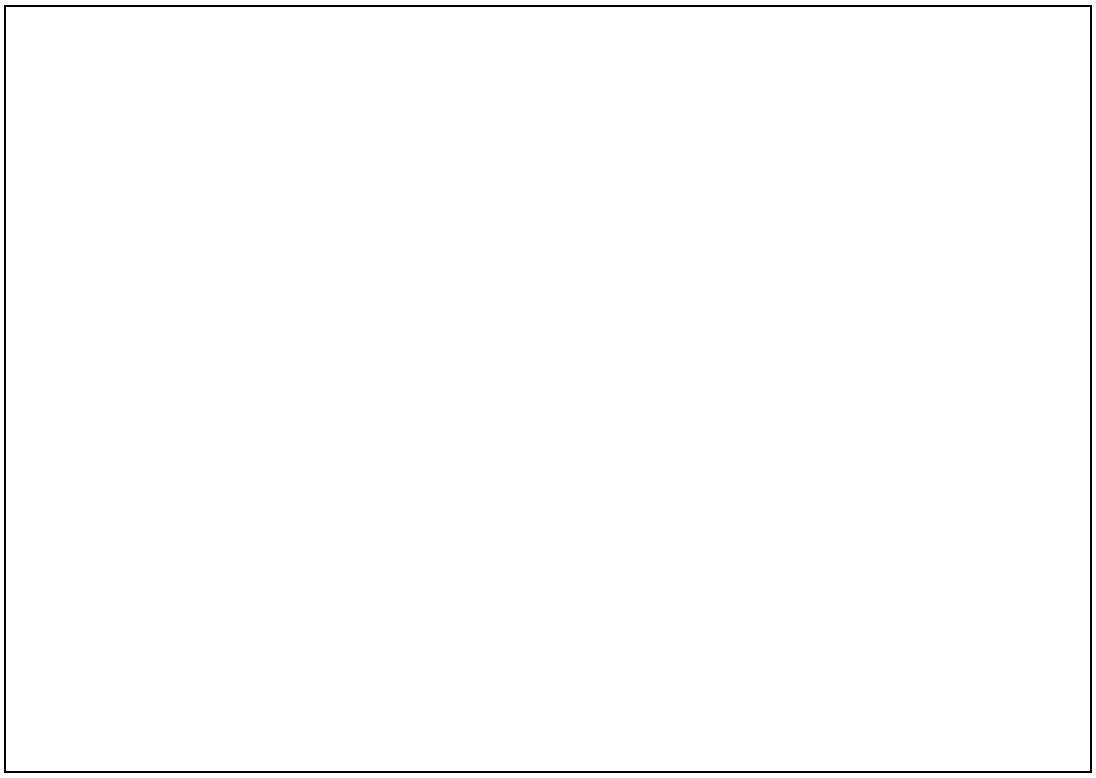
NEED FOR THE PLAN

This draft development concept plan addresses a long-standing and critical cultural resource issue at Pu`uhonua o Honaunau: the presence of non-historic structures in an area of the park where significant Hawaiian archeological features are located. These structures presently house the park's administrative headquarters and its maintenance operations and are located adjacent to and in some cases lie directly on top of Hawaiian archeological features. The structures also are a visual intrusion on the cultural landscape of a historically significant portion of the park. Moreover, they are located in a coastal area subject to damage from high waves generated by severe winter storms, hurricanes, or tsunami (tidal waves).

The purpose of the plan is to (1) identify suitable and feasible sites for the construction of a permanent park administrative headquarters and permanent maintenance facilities; and (2) provide general direction for the reestablishment of the historic scene in the coastal area following removal of the existing non-historic buildings.

The structures to be removed are structurally substandard, inadequate in size and do not provide the proper environment for the storage of the park's artifacts and photo collection. In their present location artifacts and photos as well the park's computer equipment are subject to the salt air, heat and humidity.

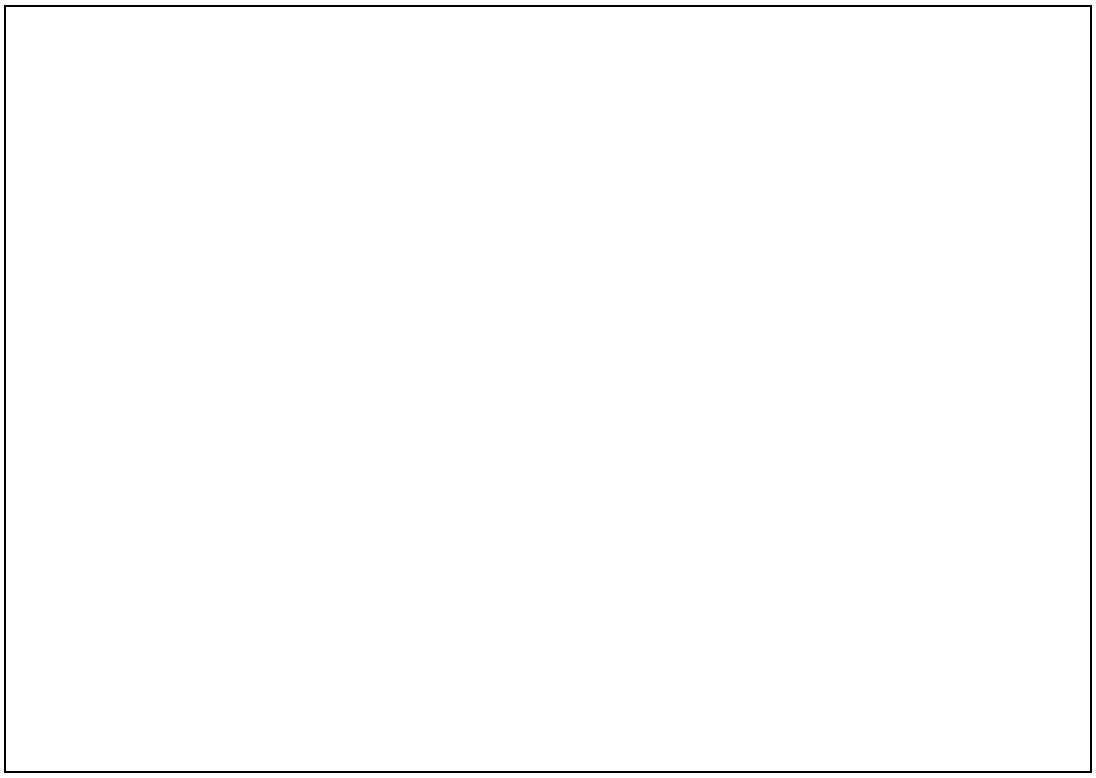
Constructed back in the late 1950s as "temporary", these wooden shacks and open-sided sheds are located in an coastal area now known to contain the remains of Hawaiian cultural features dating back to the pre-contact (i.e., prior to 1778, the year Captain Cook arrived) period in Hawaii.



The park's existing headquarters building is both substandard and inadequate, and does not provide proper

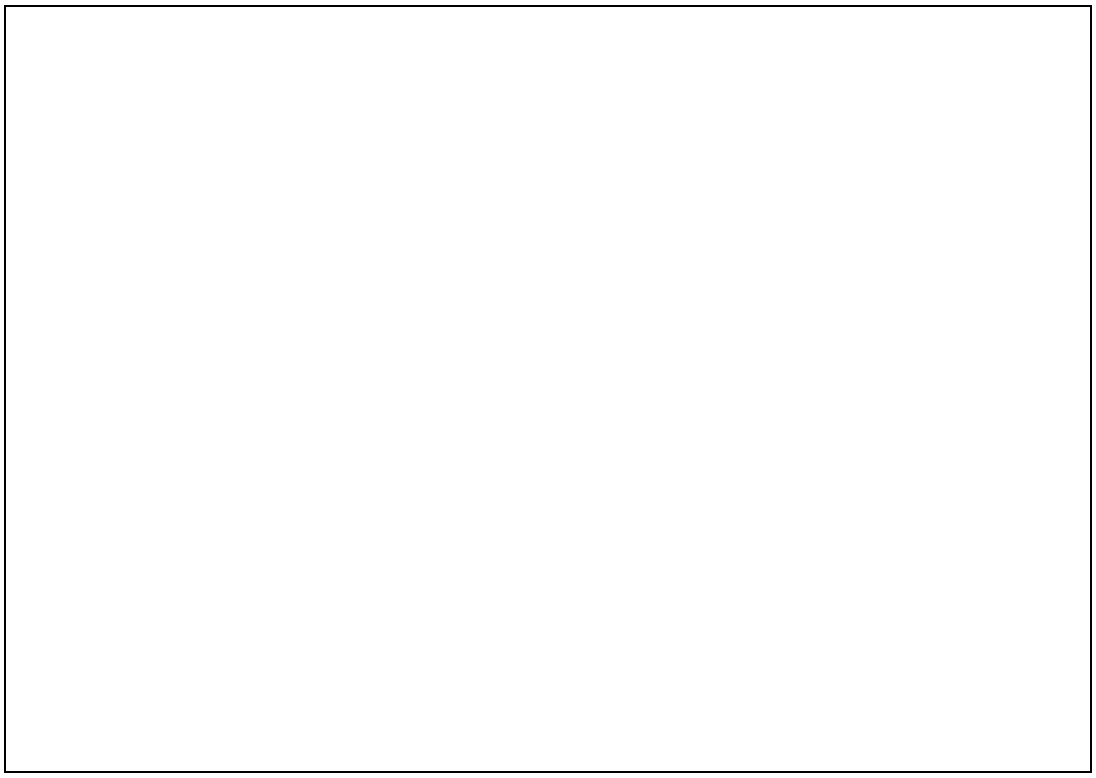
environmental conditions for the storage of park artifact and photo collections.

The

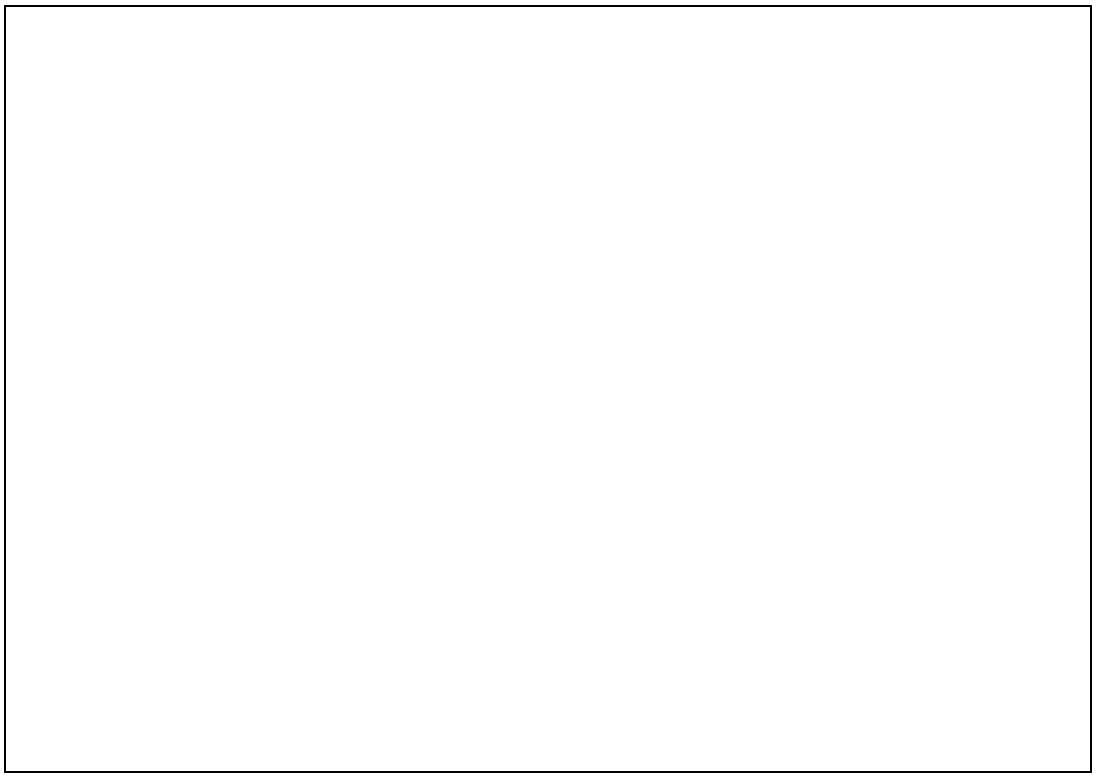


existing portable chemical toilets, used by visitors and park staff, receive about 2,000 uses/month. These facilities do not comply with Director's Order #83 and need to be replaced.

The



existing maintenance facilities consist of "temporary" wood shacks and sheds built more than four decades ago. In their present location, they are adversely affecting park cultural resources and are in close proximity to an identified coastal hazard area susceptible to wave wash generated by severe winter storms.



In a 1994 cultural landscape study, this coastal area was identified as part of a "significant resource area." The study found the buildings not only effect the cultural landscape, they also intrude upon the native coastal strand ecosystem found here. Removal of these intrusive developments would allow this culturally important coastal area of the park to be returned to its earlier appearance during the time of the Hawaiians.

The structures are also very close to a coastal hazard area and periodically susceptible to damage from high surf generated by winter storms. Two hurricanes, Iwa (1982) and Iniki (1993), struck this part of the Kona coast and the high surf conditions they generated caused damage to park resources. Though no damage was done to the structures themselves, the flooding caused by waves generated by severe winter storms has forced the closure of park headquarters and the evacuation of visitors from the coastal portions of the park several times over the past two decades. This coastline is also susceptible to tsunami (seismic sea waves generated by earthquakes). A sinking coastline and a rising ocean level foretell that this hazard will likely increase in the future.

Three portable chemical toilets are located in front of the present park headquarters. These facilities are used by visitors recreating along the nearby shoreline. The toilets, designed for "temporary" use, have been at this location for more than three decades now and are used by approximately 2,000 visitors each month--picnickers, fishermen, and beach users. Since no other facilities exist, these toilets must also be used by park administrative, maintenance, and resource management staff.

The portable chemical toilets do not meet federal health regulations for employees and do not comply with Director's Order #83: Public Health, which states chemical toilets are suitable only for temporary use in front country because they require frequent servicing and pumping to prevent objectionable odors. The pumping and hauling off-site to a treatment facility is inconsistent with the National Park Service (NPS) principles of sustainable design. Moreover, their portable design has allowed them to be picked up and moved off their foundations by the force of severe storm waves.

PU`UHONUA O HONAUNAU NATIONAL HISTORICAL PARK STRATEGIC PLAN

A strategic plan has been written for Pu`uhonua o Honaunau National Historical Park to fulfill the requirements of the Government Performance and Results Act of 1993 (GPRA). GPRA directed that federal agencies, including NPS, adopt performance management to ensure that daily actions and expenditures of resources are guided by long and short term goal setting in pursuit of accomplishing our primary mission. Based on the park's primary mission, Pu`uhonua o Honaunau has established mission-oriented goals. Based on these mission goals, long term goals (five year) have been developed. Under GPRA, these goals are to be quantifiable and measure results or outcomes, rather than efforts and outputs.

The Strategic Plan for Pu`uhonua o Honaunau consists of a mission statement, mission goals and long-term goals which target quantified, measurable ways what the park will accomplish in terms of meeting its overall mission and goals.

The preparation of this draft development concept plan is based on the park's clearly defined mission, its goals and the management direction for resource protection and visitor use. The plan will help meet the following mission and long-term goals:

Park Mission Goal: The cultural and natural resources are protected, restored, maintained and preserved for present and future generations.

Park Mission Goal: Visitors safely enjoy and are satisfied with the availability, accessibility, diversity and quality of park facilities, services and appropriate opportunities.

Park Long Term Goal: 85% of park visitors are satisfied with park facilities, services, and recreational opportunities.

EXISTING CONDITIONS

PLANNING HISTORY

The park's Master Plan, approved in November 1977, calls for the removal of all existing administrative, maintenance, and park housing facilities from the culturally significant coastal area and their relocation to a more suitable site, as well as the restoration of the coastal area to a setting where the atmosphere of historic Hawaii can be experienced. The master plan also calls for development within the park to be kept to a minimum, with visitor services directed toward presentation of the park setting as a representation of the way it was during the time of the Hawaiians. The continuation of picnicking and fishing in the park is based on the promise made by NPS prior to the park's authorization that such uses by local Kona residents would be allowed to continue in certain designated areas.

Park management objectives contained in the latest Statement for Management call for the relocation of the administrative, maintenance, and residential facilities away from their present location and restoration of that area to conditions existing during the park's historic period.

The Statement for Management places all of the park lands, a National Register property, within a Historic Zone. These lands are managed to preserve, interpret, and protect the historic resources of the park. The Statement for Management has included the existing facility developments within a Park Development Subzone. The subzone, in four locations, covers those portions of the primary zone encompassing the visitor center, visitor parking, entrance station, and entrance road; as well as the picnic area, the administrative, maintenance, and housing facilities, the sewage treatment plant, plus the detached parcel and those associated lands directly modified as a result of their continuing management and use.

During cultural landscape planning for the park in 1994, the NPS planning team further subdivided the park's Historic Zone based on the nature and significance of the cultural resources found within the zone. The coastal area containing the present park administrative, maintenance and housing facilities was determined to be part of a "significant resource area." Significant resource areas, in terms of cultural landscape management, are defined as those with significant concentrations of cultural and natural resources that display patterns, relationships, and features related to defining the landscape as a cultural system. Preservation of the cultural landscape and the historic scene in these areas is critical.

Other management objectives relevant to the preparation of this development concept plan include providing opportunities for the continuation of certain long-standing and traditional recreation activities by local Kona residents in the park such as picnicking and fishing, and

managing them so that there will be no conflict among the activities or any interference between recreation and the primary purpose of the historical park.

The Master Plan and the Statement for Management also call for adding lands to the existing park to protect adjacent cultural resources, prevent incompatible development and provide a site for the development of additional facilities for the providing of visitor services. However, additional legislative authority is needed before any lands can be added to the park. In 1980, Congress introduced legislation calling for the expansion of the park's boundary. The bill was never enacted. No further legislative action has occurred since then.

During master plan development in the 1970s, it was believed that the park would experience rapid and substantial increases in visitation and that long-range planning must consider how to deal with moving large numbers of visitors in and out of a fragile and culturally significant area. Access to the area was proposed at that time to be via a trackless, open train or similar vehicle, providing service from a central location where the visitor would leave their cars or buses. Additional lands mauka of the existing park were to be added and utilized for the development of a permanent headquarters, maintenance operation, visitor orientation, and auto/bus parking facilities.

Based on visitation figures over the past several decades, it is now believed that the existing visitor center facility and adjacent parking will be adequate to serve the needs of visitors for the foreseeable future. No additional development is needed to provide visitor services and no people mover vehicles are judged to be necessary.

LEGISLATIVE HISTORY

Pu`uhonua o Honaunau was authorized as a unit of the national park system on July 26, 1955 (69 Stat. 376) as the City of Refuge National Historical Park "for the benefit and inspiration of the people...." to "be administered by the Secretary of the Interior subject to the provisions of National Park Service Organic Act of August 25, 1916...and such additional authority compatible therewith...with regard to the preservation of historic sites and objects of national significance." The park was established to preserve, protect, and interpret the pu`uhonua, the "place of refuge", of Honaunau, the associated complex of remains, the historic scene and cultural practices which together represent several key phases of the traditional Hawaiian culture. The park was to be officially established when title to the lands described in the authorizing legislation became vested in the United States. This was accomplished by Secretarial Order, effective July 1, 1961, when Bishop Estate lands were donated to the State of Hawaii, then conveyed to NPS. The park is listed on the National Register of Historic Places and national park boundaries coincide with historic property boundaries.

On November 10, 1978, the Act of July 26, 1955 was amended to redesignate the City of Refuge as the Pu`uhonua o Honaunau National Historical Park. Pu`uhonua o Honaunau, meaning the place of refuge of Honaunau, was the name given to this important area by the

Hawaiians who once lived here.

PARK LANDS AND FACILITIES

The park presently encompasses 181.87 acres of federal lands. These federal lands include a 3.7-acre detached upland parcel located *mauka* (inland) about three miles distance along the main entrance road to the park. The detached parcel is connected to the *makai* (ocean) parklands via a water line easement across lands owned by the Bishop Estate. The park boundary along the coast extends out to the high tide line, the point at which the State of Hawaii claims jurisdiction.

Major visitor use facilities are located in the northern portion of the park near the small village of Honaunau. These facilities consist of a visitor center complex (visitor contact station, cooperating association sales area, offices for interpreters, storage rooms, visitor rest rooms, an exhibit wall and covered walkway and a large covered amphitheater), a sewage lift station, visitor parking, entrance station, and entrance road.

The park's sewage treatment plant is located in the northeastern (*mauka*) section of the park and is accessible via an unimproved and abandoned county service road branching off the park's main entrance road. Those portions of the service road nearest the entrance road are located outside of the present park boundary. Wastewater from visitor center rest rooms presently flows to a nearby lift station where it is collected and pumped to the treatment plant. Primary and secondary treatment are provided at the plant. The treated effluent flows into two seepage pits located next to the plant.

Compliance and final design have been completed and construction is underway for the replacement of the existing lift station, located in a prime historic area of the park and subject to inundation from waves generated by winter storms. Compliance and final design have also been completed for the replacement of the existing treatment plant with a septic tank and seepage beds. The present treatment plant is nearly 30 years old and its continuing operation is no longer cost-effective. Construction of a replacement lift station and wastewater treatment facilities are scheduled to begin in the Spring of 2000.

Located about one-quarter mile down the coast from the visitor center and accessible via a dirt road are the park's present administrative and maintenance facilities, an unimproved parking area and portable chemical toilets. These facilities consist of a headquarters office wood shack and three large, open-sided wood sheds utilized as a maintenance shop and material equipment storage. Across the unpaved access road is the unimproved visitor parking area. Picnic tables and barbecue grills have been installed nearby along the coast.

Access to Pu`uhonua o Honaunau is via State Route 160, a scenic highway built several years ago by the State of Hawaii to connect the park with the main highway (SR 11) along the Kona coast. Much of the new scenic highway was constructed on top of the old county road to

Honaunau. The old county road is no longer used as a public roadway and only a remnant remains. Some of the unused portion of the old road is used by NPS as the means of access to the park's sewage treatment plant. Where SR 160 terminates at the entrance to Pu`uhonua O Honaunau, a county road continues north to Kealakekua Bay.

Much of the land in the detached parcel located mauka is in use as a nursery to grow native plants. The parcel fronts on SR 160 and the lower portions contain a building utilized as an environmental education center and dormitory and a second building nearby is used for curatorial storage. The parcel is accessible via a paved entrance road.

The dormitory building is used regularly for training, environmental education, and Hawaiian cultural education. The nursery area has been planted with native plant species, some of which the national park utilizes for its cultural demonstrations and yearly cultural festival. The natives are also planted in the park as part of the resource management program to help restore the historic landscape. Wastewater from the dormitory building flows to a septic tank and then to a cesspool.

Water is supplied to the park by the Hawaii County Department of Water Supply. A buried six-inch waterline enters the park from the highway and, running along the edge of the visitor parking lot, flows to the visitor center rest rooms. A surface waterline runs to the existing maintenance area located near the coast.

The park's electricity is supplied by Hawaiian Electric and Lighting Company (HELCO) and telephone service by GTE Hawaiian Telephone. Electrical and telephone lines enter the park from the pole located on the shoulder of the unused service road. From the pole the lines go underground in a common trench running along the shoulder of the service road, through Honaunau village and to the visitor center. Electrical and telephone lines run along the surface in a conduit to the existing administrative and maintenance area.

A six-inch sewer line runs in an underground trench from the visitor center rest rooms to the sewage lift station and then to the sewage treatment plant via a four-inch pressure line.

VISITATION

In 1999, park's annual visitation totalled 435,810. Visitation has shown regular though not dramatic increases since 1981. The pattern of visitation is fairly constant throughout the year, with minor increases in numbers occurring during the summer months and during holiday weekends. Major increases in visitation occur during the park's cultural festival held each year.

The park's daily visitation usually peaks during the three-day cultural festival held each year in late June or early July. Visitation is entirely day-use except for small numbers of night fishermen and picnicking by local residents. The heaviest period of visitor use is usually mid-day and the pattern consists usually of an orientation talk, a tour of the palace grounds,

demonstrations of traditional Hawaiian activities and a walking tour of Hale O Keawe and the place of refuge. The duration of the visit is generally under an hour. A few visitors choose to take the hike along the historic 1871 trail down to the see the remains of the historic Ki`ilae village located at the southern end of the park.

Figure 1. Existing Conditions

Annual Visitation

1974	241,880	1987	415,580
1975	339,620	1988	392,537
1976	356,860	1989	414,580
1977	446,568	1990	392,366
1978	491,985	1991	401,540
1979	409,436	1992	434,110
1980	372,212	1993	424,819
1981	335,441	1994	454,457
1982	345,920	1995	436,654
1983	347,840	1996	458,035
1984	383,120	1997	478,023
1985	394,844	1998	492,210
1986	432,400	1999	435,810

Approximately three-quarters of the park's visitation come from off-island tourists. About two-thirds of these come via tour car or bus and about one-third come via rental car. Many of these visitors are coming from the Kailua-Kona area to the north. The remainder of the park's visitors is composed of Big Island residents, usually from the Kona area.

The portion of the park's visitation by Big Island residents usually increases from about one-quarter to closer to one-half during the summer months, over holidays, and on weekends. Local visitors stay longer in the park, generally from one to three hours, and many come to engage in recreational or cultural activities. Local residents also assist the park in interpretive activities during the park's annual cultural festival.

The 1977 master plan set 2500 visitors/day as the carrying capacity for the park in order to maintain the quality of the visitor experience at a high level and to adequately protect both cultural and marine resources from damage. Presently, visitation averages about 1,200/day.

AFFECTED ENVIRONMENT

NATURAL RESOURCES

Climate

The climate at the park is warm and relatively dry. Trade winds and the showers they often bring are uncommon along this Kona coast because these winds are blocked by the large mountain mass of Mauna Loa. There is little variation in temperature from month to month with the average annual maximum being 88 degrees F and the average annual minimum 65 degrees F. The day and night difference is about 20 degrees F. During the summer months, there are occasional uncomfortable days when the temperature and the humidity are high and the air movement is minimal. The mean annual rainfall at Honaunau is about 26 inches. January and the summer months of June, August, and September have the highest monthly mean rainfall. There are rare periods of prolonged showers, usually occurring during winter storms.

Typical daily weather patterns for the Kona coast are clear skies in the morning, followed by increasing cloudiness and rain at higher elevations in the early afternoon as the temperatures increase. In the evenings, as temperatures decrease, light offshore winds come down off mountain slopes and the cloudy conditions cease. Nights are usually cool and cloudless.

Winter storms move through this area most frequently from December through February. Coming from the west and south, these "Kona" storms bring with them high winds, high seas, and heavy rains. During such periods, conditions are created which are hazardous enough to require closing the park shoreline to visitors. As noted, within the past two decades, two hurricanes have struck this coastline. Tsunami have occurred infrequently along the Kona coast.

Water Resources

The lava flows and scattered soils in the national park are very porous and consequently surface water features are absent. There are no perennial streams within the national park. A single intermittent stream of moderate sized drainage crosses the southern portion of the park next to Ki`ilae village before emptying into the ocean. Freshwater is presently available in Ki`ilae village from a subterranean source. It is assumed that a source of freshwater, probably subterranean, must have also been available at Honaunau sometime in the past in order to have sustained the previous human settlement there.

The original purpose of the detached parcel was to provide a source of water to the park through the construction of a rainwater catchment on that property. However, the park,

including the detached parcel, was subsequently connected to the county water system. This supply continues to be more than adequate for the park and any need for the construction of the catchment has never materialized.

Air Quality

At present, there are no air quality monitoring stations on the Kona coast of the island of Hawaii. Volcanic activity along Kilauea's east rift zone, which has been continuous since 1983, has had a detrimental effect on the park's air quality during periods of eruption. Air quality over much of the island of Hawaii deteriorates during these eruptive periods and visibility can be affected when wind conditions are right. South Kona is particularly susceptible as wind patterns in this area tend to produce a higher concentration of pollutants. Despite the volcanic eruptions, air quality in the park remains good most of the time.

The preservation, protection, and enhancement of the air quality in units of the national park system is an important component of the federal Clean Air Act, as amended. Under that Act, the park has been designated as a Class II area. With this designation, the maximum allowable increase of particulate matter and sulfur dioxide has been established as follows:

Maximum Allowable Increase
(micrograms per cubic meter)

Particulate matter:

Annual geometric mean	19
Twenty-four hour maximum	37

Sulfur dioxide:

Annual arithmetic mean	20
Twenty-four hour maximum	91
Three-hour maximum	512

Flood Hazard

The park has been surveyed under the national flood insurance program. The Hawaii County flood insurance rate maps covering the park (Community-Panel Numbers 155166-1166C and 1167C) show the extent of flood hazard areas in the park--that is, those areas subject to inundation by a 100-year flood. Base flood elevations have been determined along the park's coast and along the watercourse of the stream located next to Ki`ilae village.

As noted, winter storms along this coast can bring high surf into the park causing damage to cultural resources, including the place of refuge. In 1980, 1983, 1985, and 1986, the coastal portions of the park were covered by water from storm wave run-up. During these times the park was closed to visitors.

In 1982 and in 1993 hurricanes struck the Hawaiian Islands. The first, Hurricane Iwa, affected portions of the Kona coast of the Big Island. At Pu`uhonua O Honaunau, the force of ocean waves moved the portable chemical toilets located near the administrative headquarters about 50 feet from their foundations. Hurricane Iniki struck the park in September 1993, causing considerable damage to the park's cultural resources and infrastructure. The stone wall around the Hale o Keawe and stone walls in the palace grounds were demolished; ocean water entered the manhole of the sewage lift station; about a foot of sand, rocks, and debris were deposited along coastal portions in the picnic area and in front of the existing administrative headquarters and maintenance area; the stone wall fronting the then existing housing unit was destroyed; and about 300 feet of the 1871 trail were destroyed.

Tsunami occur very infrequently on the Kona coast of the island of Hawaii. There were three such seismic waves recorded during the 1800s. In 1946, 1957 and 1960, wave run-ups from tsunami of two, five, and three feet respectively were recorded along this coast. Tsunami evacuation maps prepared for this portion of the Kona coast show all of the park to be within areas to be evacuated in the event of a tsunami warning. Since the park and the nearby village of Honaunau are located on low-lying lands, a special tsunami warning system has been installed in the park in cooperation with Hawaii County Civil Defense.

Topography and Soils

The park's topography consists generally of a coastal plain of pahoehoe lava flows gradually sloping down to the ocean in a westerly direction. Most of the park lies below the 30-foot contour line. The topography was formed primarily from prehistoric lava flows emanating from flank and summit eruptions of Mauna Loa, a 13,680-foot high, massive shield volcano to the east. Most of the park substrate is composed of lava flows from 750 to 1,500 years old. Honaunau Bay forms the northern end of the park's flat shoreline. South of the bay, the shoreline is marked by many small inlets and tide pools. At the southern end of the park, sea cliffs form the shoreline at Ki`ilae Bay. Just north of the bay, these cliffs turn inland forming a crescent-shaped fault escarpment more than 100 feet high. There is local earthquake activity connected with this fault. The last serious earthquake in this area occurred in 1951 and caused structural damage to buildings in the vicinity of the park.

The coastal plain on which the park is situated is also being influenced by coastal fault subsidence. The U.S. Geological Survey estimates the present rate of this subsidence to be about four millimeters per year or about one foot every fifty to eighty years.
Moana Loa is still an active volcano. The latest flows descending from the western slopes of the volcano are from 1949 and 1950 eruptions. The 1949 flow stopped at about the 8,000-foot level above Honaunau. The northernmost of these flows reached the ocean seven miles south of Honaunau Bay and one flow stopped at about the 8,000-foot elevation above Ho`okeua. Moana Loa's latest eruption, occurring in 1984, sent no lava flows toward the Kona coast.

The ground surface of the park is mostly bare pahoehoe lava interspersed with shallow pockets

of undeveloped soil material derived from basaltic volcanic lava. Very little soil

Figure 2. Flood Hazard Areas

development has taken place on the park's lava flows. Where found, it consists of accumulations of weathered lava bits, material from the sea and vegetal debris in pockets and depressions in the pahoehoe lava flows. In the vicinity of Honaunau, soils have been classified as a type of lithosol called rockland. This type of soil consists of a very thin covering of volcanic ash on young, relatively smooth and unbroken pahoehoe. In most places the soil layer is about four to six inches thick and generally in pockets in depressions in the lava flows.

Calcareous beach sand deposits occur along most of the park's shoreline. The sand forms a narrow strand and berm complex just inland of the barren lava spray/splash zone. These beach soils are also poorly developed with no profile differentiation.

Wetlands

There are no wetlands located within the boundaries of the national historical park.

Vegetation

Today, nearly all of the vegetation at Pu`uhonua o Honaunau is composed of alien plant species, primarily in the form of shrubs, grasses, sedges, forbs, and trailing vines. The park's vegetation can be grouped into four basic vegetation types: (1) a narrow, salt-spray and beach-strand zone nearest the ocean composed predominately of xerophytic scrub of mostly native species; (2) managed groves of planted coconut palms confined to those areas around visitor use facilities; (3) scattered grasses dominated by alien (introduced in Hawaii since 1778) species; and (4) a mixed shrubland also dominated by alien species. The last two components comprise nearly all of the park area.

Vegetation surveys carried out in the park have recorded a total of 134 vascular plant species. Nearly three-quarters of these, 96 species, were alien to Hawaii. About 17 percent, 23 species, are indigenous (native to Hawaii, but occurring naturally outside of Hawaii), four percent, six species, are endemic (occurring naturally in Hawaii and found no where else), and 11 percent, 15 species, are Polynesian introductions (brought to Hawaii many centuries ago by the first Polynesian settlers). Most of the native species are found near the shoreline or as plantings near the visitor center.

The most recent vegetation survey found that most of the park away from the visitor center and coast was covered by alien shrubs in which ekoa or koa haole (*Leucaena leucocephala*) was the dominant species. The southern third of the park was vegetated with tall koa haole with a ground cover of Guinea grass (*Panicum maximum*).

Natal redtop (*Rhynchelytrom repens*), a perennial grass native to Africa, is common along the 1871 Trail and north of the Alahaka Pali.

Plant species found along the coast and near the ponds adjacent to the Great Wall include native trees, sedges, a vine, and a sprawling herb. Native trees found along the shoreline include milo (*Thespesi populnea*), hala (*Pandanus tectorius*), and naupaka kahakai (*Scaevola sericea*).

Native sedges found near the ponds and the Great Wall consist of makaloa (*Cyperus laevigatus*) and mau`u `aki`aki (*Fimbristylis cymosa*). The sedge, `ahu`awa (*Mariscus javanicus*), in addition to being found scattered throughout the area enclosed by the Great Wall, was widespread on the bare lava along the coastal portions of the park. The area within and adjacent to the Great Wall supports a grove of coconut palms or niu (*Cocos nucifera*).

Prior to the time of Hawaiian habitation of the area, the vegetation of the park was probably a dry forest or shrubland of `ohi`a (*Metrosideros polymorpha*), with shrubs, grasses, and other native trees such as wiliwili (*Erythrina sandwicensis*), naio (*Myoporum sandwicense*), and alahe`e (*Canthium oderatum*).

Historically, vegetation of the park area was open, with groves of planted trees and patches of grass. Sparse vegetation prevailed until after the 1920s. By the 1950s, the area was covered by thorny introduced shrubs and was maintained as a county park. Alien shrublands have been prominent at the park for more than 40 years.

From 1962 to 1963, efforts were made to clear those portions of the park east of the 1871 trail of alien vegetation. Around this time, coconut palm was planted in the palace grounds and the picnic area of the park to provide shade for visitors. Coconut palms were planted in what is now the park as early as 1867, when Princess Bernice Pauahi Bishop had them planted as part of a ceremony transferring ownership of the land here to her. Palms were also planted in 1908. Park management calls for those areas planted in coconut palm to be maintained in their present extent by replacing individual over-mature palms with sprouting coconuts.

Vegetation management presently consists of treatment and manual removal of alien vegetation. Buffel grass (*Cenchrus ciliaris*), prickly pear cactus (*Opuntia ficus-indica*) and date palm (*Phoenix* sp.) are a high priority for removal. Where appropriate, alien species are to be replaced with native species such as milo (*Thespesia populnea*), hala (*Pandanus odoratissimus*), naupaka kahakai (*Scaevola sericea*), kou (*Cordia subcordata*), noni (*Morinda citrifolia*), ilima (*Sida fallax*), or pili (*Heteropogon contortus*) which now exist in the park as remnants.

Vegetation management throughout the park requires the continuation of ongoing control methods because invasion and regrowth of alien species are constant factors. Those areas near the shoreline makai of the 1871 trail require highly selective vegetative management, including manual removal of alien species and stump application of an approved herbicide.
The 3.7-acre detached parcel, called the upland garden or Kihapai uka, is located at an elevation of 800 feet and situated in an attitudinal belt of vegetational transition between coastal and upland forest. The lower portions of the parcel, between the road and just behind the dormitory, have been cleared of alien growth and planted with representative native and Polynesian species and several listed endangered species. These plants are considered to be seed sources for future outplantings in the park. The uncleared and undeveloped upper portions are covered with alien shrubs and grasses, among which a number of large kukui (*Aleurites*

moluccana) are scattered. Although still plagued by introduced grasses and vines, a number of planted native species have become established here.

Figure 3. Vegetation

Animals

Birds are the predominant form of animal life found within the park. The 1996 Cooperative National Park Resource Studies Unit report on the birds of the park was based on counts made in September and October 1992 and March 1993. A total of 12 bird species were detected during these counts. During both of those periods, no indigenous birds, other than migratory shorebirds, were seen. The Japanese white-eyes (*Zospterops japonica*) and the Common myna (*Acridotheres tristis*) were the most widespread and common species seen in the park. Other species detected in certain locations within the park included safron finches (*Sicalis flaveola*), lavender waxbills (*Estrilda caerulescens*), and spotted doves (*Streptopelia chinensis*), nutmeg mannikins (*Lonchura punctulata*), and yellow-fronted canaries (*Serinus mozambicus*). The lavender waxbill was detected in areas away from usual visitor activities and, along with the spotted dove, tended to be detected more upslope during the fall count and more downslope during the spring count. The nutmeg mannikin and yellow-fronted canaries had not been previously recorded at the park.

The Hawaiian hoary bat (*Lasiurus cinereus semotus*), the only mammal native to the Hawaiian Islands, is sighted occasionally at night in the waters offshore of the park. The Hawaiian bat is listed as an endangered species. No other threatened or endangered animal species are found within the national park. The most common mammal in the park is the mongoose (*Herpestes griseus*), introduced to Hawaii in 1883 to take care of the rat problem. Instead, the mongoose decimated ground-nesting birds and their eggs. The black rat (*Ratus ratus*) and the house mouse (*Mus musculus*) are also present in the park. Feral cats are occasionally seen in the park.

One hundred fifty insect species have been collected within the park out of a total of 609 insect species recorded for the Kona district. Of these, 12 are considered native to Hawaii. All of the species of leafhoppers collected in the park are considered endemic. Only one of the many species of native damselflies has been collected at Honaunau. This species is common and often found from the sea level to the native forest.

Reptiles commonly found in the park include three species of geckos and three species of skinks. Geckos are more active at night, usually seen in houses or on screens catching insects attracted to lights. Skinks are more active during the day, commonly seen sunning themselves or darting in search of insects in the open or from under rocks.

HAWAIIAN CULTURAL RESOURCES

The entire park was listed on the National Register of Historic Places in 1966. The Pu`uhonua o Honaunau was recorded by the National Survey of Historic Sites and Buildings in 1962. This survey recorded 321 archeological and historical features. Fifteen of these were identified as contributing features: Hale o Keawe, the Great Wall, "Ale`ale`a, Ancient Heiau, Chief's House Site/Thompson House Site, Keawe's House Site, `Oma`o Heiau, Keanae`e Heiau/Alahaka Ramp, 1871 Trail, Ki`ilae Village, and the Keanae`e Shelters.

The park's primary resources are connected with the Hawaiian culture. During the time of the Hawaiians, this particular area was a favored residence of ruling chiefs of the island of Hawaii. More important, it was a place of sanctuary. At Honaunau, refugees (kapu breakers, defeated warriors, noncombatants) from death at the hands of any pursuer could flee and be safe, placed under the protection of the Hawaiian gods. Once within the walls of the pu`uhonua, fugitives were absolved of their guilt by the priest. When they were free to return to their homes, the protection of the gods went with them.

These sanctuaries, where kapu breakers could go and receive absolution for their violations, were special places during Hawaiian times. Pu`uhonua o Honaunau, the "place of refuge at Honaunau", was considered sacred ground by the Hawaiians long before Columbus sailed for the New World. Today, the Pu`uhonua at Honaunau is still regarded as a sacred place and is one of the most significant archeological and historic sites in Hawaii.

The national historical park owes its primary significance to the centuries-old stone wall that delineates the ancient place of refuge. The great "L" shaped wall of huge stacked stones, built around 1550 A.D., measures about 1,000 feet in total length, ten feet high, and 17 feet wide. It sets off some six acres of land within which are located three Hawaiian temples, called heiau. The oldest of these, believed to have been built about 1200 A.D. and located closest to the ocean, is now almost completely in ruin. The second, 'Ale'ale'a, was built later and is in much better condition. It is believed that 'Ale'ale'a was constructed using some of the stones of the older heiau. The third, the platform supporting the completely restored Hale o Keawe, was originally built around 1650 A.D. to house the remains of more than 20 deified chiefs from Kona. The platform supports a thatched hale or house representing the mausoleum of the deified chiefs, an offering tower, reproductions of sacred images, and a wooded palisade.

Adjoining the pu`uhonua are the Royal Grounds containing the dwelling areas and the royal fish ponds of the ruling chiefs of Kona. These chiefs were the source of the laws that regulated the lives of all the Hawaiians living there. Nearby, on the north shore of Honaunau Bay were the homes of the lesser chiefs and the common people who served the ruling chief and the priests.

As with the other coastal portions of the park, the coastal shelf on which the place of refuge is located is subject to inundation from waves generated by winter storms or hurricanes. This entire area can be covered and battered by high seas.

The remains of another village, Ki`ilae, located at the southern end of the park and beyond. The remains consist of about a dozen house lots enclosed by stone walls. Within the walls are house platforms, shelter caves, and tapa-making shrines. The village was inhabited up until 1926, making one of the last Hawaiian coastal villages to survive. Other cultural resources found within the park include the 1871 trail, all or parts of three stone holua slides, the house sites of chiefs, burial and shelter caves, and petroglyphs,

In 1962 and again in 1963, NPS contracted with the Bishop Museum to conduct archeological excavations at the park. The 1962 archeological salvage work was limited in scope, confined to those areas within the park proposed for the construction of visitor use facilities. The 1963 work covered a wider area of the park.

Most of the artifacts collected from the 1962 excavations were familiar examples of Hawaiian material culture. However, several items were previously unrecorded or only rarely known from other excavations. Six basic types of sites were identified during the 1963 excavations: (1) artifacts in open sites, (2) stone platforms, (3) house floors or habitation sites, (4) open sites that yielded nonartifactual remains [these were thought to be resting or camping sites], (5) cave sites, and (6) burial sites. Additionally, during the 1963 work, more than 100 petroglyphs were recorded in the park.

In 1963, NPS conducted several archeological investigations within the park. These investigations included digging test pits and salvage excavations at several sites at the northern end of the park within the area for the then proposed park entrance road and visitor parking, and stabilization work at the Great Wall, `Ale`ale`a Heiau, Honaunau Holua slide, and Ki`ilae Village.

Under the supervision of the park archeologist, an archeological base map of the park was prepared in 1964. Based on existing field surveys, all known stone walls, burial sites, house platforms and heiau in the park were mapped.

In total, past surveys of cultural resources have recorded a total of 321 archeological and historical features within the park. Most of these numerous features are located *makai* of the 1871 trail. Most archeological sites at Pu`uhonua o Honaunau are on the surface. Stratified or buried sites are rare. Loss of structural data and portable artifacts at the park is usually from natural forces (growth of root systems and a rising sea level) and increases in visitor traffic.

A basic goal of resource management at the park is the protection of the cultural landscape; in particular, protecting, preserving, and restoring the integrity of the historic scene in those areas where associated structures or other tangible remains of historic resources are located.

REGIONAL SETTING

Pu`uhonua o Honaunau National Historical Park is located along the Kona coast of the Island of Hawaii in the district of South Kona. Access to the park is via State Route 160 which connects with State Route 11, the Mamalahoa Highway, the island's major highway. The park is about an hour drive from the Kona airport and about 45 minutes from Kailua-Kona, the principal town on the Kona coast.

Thus far, the lands surrounding have remained free of large-scale development connected with the tourism industry on the Big Island of Hawaii. The coastal portions of the South Kona

district remain essentially in open space--a quiet and relatively remote rural environment. Next to the northern boundary of the park is the tiny coastal village of

Figure 4. Cultural Resources

Honaunau, made up of several small parcels consisting of privately-owned lands, including kuleana[1], Bishop Estate leaseholds, and lands owned by the Roman Catholic Church.

About 12 permanent residents live here. As noted, Kamehameha Schools operates a school program in the village.

Located alongside the village and park on Bishop Estate lands, the school was originally set up by the State of Hawaii and the Kamehameha Schools (Bishop Estate) as an outreach special education program.

The school was attended by up to 25 students. Today, the building houses a pre-school program of Kamehameha Schools. The adjacent Honaunau Bay supports a high diversity and abundance of marine biota. The bay and the sand beach at Kapuwai Cove have long been used by village residents and members of the nearby Kona communities as a swimming beach and for the launching of small fishing boats at the nearby boat ramp.

During weekends, anywhere from 50 to 100 people/day come to Honaunau Bay to swim, launch their boats or canoes, or to snorkel or picnic. About 20 boats/day are launched at the ramp. Honaunau Bay itself supports a highly diversified and abundant marine biota.

The above described developments and facilities are regarded by NPS as compatible with the setting of the historical park. The historical flavor of the Honaunau Bay area is enhanced for park visitors by the presence of local people still actively pursuing traditional uses of the nearby shore and water areas.

At the present time, lands around the park are owned by the Bishop Estate, except those at the southern end. These lands are owned by the Kai Malino Ranch. These surrounding lands are being used primarily for livestock grazing. However, plans are presently being formulated by the Kai Malino Ranch to build an Assisted Live-In facility for about 40 individuals with a staff of 12 to 15 people.

The higher elevation lands in the vicinity being cooler and moister are used for agricultural purposes to grow coffee beans, macadamia nuts, papaya, and avocado.

Figure 5. Location

PLAN ALTERNATIVES

SITE AND DESIGN REQUIREMENTS

Replacement administrative offices and maintenance facilities need to be located in areas where park resources--cultural, natural, or scenic--would not be adversely affected. The new locations should also allow improvements in the overall efficiency of park operations. The new structures should be modest and, most important, designed to harmonize with the cultural landscape of the park and the rural ambience of the surrounding area. Further, these facilities should not interfere with or disturb visitor services or detract from the quality of the visitor experience. They should be easily accessible and in accordance with all regulations and standards. Sound planning and design principles should be used to ensure safety for visitors and park staff. Facilities should be sited so as to avoid any adverse environmental impacts or costly mitigation. The design of all new construction must meet standards of the American Disabilities Act.

New administrative and maintenance facilities need to be developed in accord with sustainable planning and design guidelines wherein natural systems are to be conserved and environmental impacts minimized. These guidelines include the following:

- siting and landscape concepts that maintain ecological integrity and reduce energy and resource use;

- architectural designs and colors that are harmonious with the cultural landscape or historical setting, conserve energy and resources, are enduring, and contribute the least damaging toxicity and waste to the environment; and

- construction processes that minimize site damage to the topography and vegetation, debris, and waste.

The following considerations were used to assess the environmental feasibility of sites for proposed facility development: accessibility, suitability for construction, potential for flooding and damage from storm waves, adverse impacts on archeological sites and features, adverse impacts on the park's cultural landscape or historic setting, adverse impacts on native vegetation, and interfering with or lowering the quality of the visitor experience.

The year-round warm temperatures associated with this area require that maximum advantage be taken of prevailing wind patterns when siting, orienting and designing the buildings (winds blows from the ocean during the day and from the mountains at night). Careful orientation and

design of facilities would limit the need for air conditioning to rooms with special demands--e.g., where computers are in use, where artifacts and photos are stored.

The entire park is listed as a National Register property. Consequently, prior to any ground disturbing activities taking place in conjunction with any proposed developments, archeological surveys and testing will be conducted at proposed construction sites in compliance with 36 CFR 800.

Existing Management Zones and the zones developed during the cultural landscape exercise were also utilized to assist in determining suitable and feasible sites for locating the administrative and maintenance/resource management facilities.

Based on site inspections, discussions among the superintendent, park division heads, interpretive staff, NPS planning and design professionals, and interested individuals from the nearby community, as well as a review of park resource inventories, this draft development concept plan has identified feasible and suitable sites for the construction of new developments to replace existing facilities. The new facilities will allow the restoration of the historic scene and cultural landscape on those coastal portions of the park where the present facilities are now located.

The proposed action and a no action alternative are described in the following sections. The no action alternative serves as a baseline against which impacts are analyzed in the environmental assessment. The proposed action represent the most feasible management option for meeting the needs described earlier.

ALTERNATIVES TO PROTECT RESOURCES AND IMPROVE PARK OPERATIONS

Alternatives Considered and Eliminated

A full range of alternative were identified and considered during the preparation of this draft development concept plan for relocating the park's administrative and maintenance operations. A mini value analysis (CBA) was carried out on these alternatives by the park superintendent and Pacific Islands Support Office planning and design professionals. Attributes such as protection of park resources, visitor enjoyment, operational efficiency, aesthetics, constructability and cost were utilized in the evaluation of these alternatives.

The following alternatives, after being evaluated, were eliminated from further consideration.

Lands and Structures Outside of Park Boundaries. Nearby lands were considered to determine if any suitable and feasible sites existed for constructing Pu`uhonua O Honaunau's administrative and maintenance operations. It was learned the present landowner does not wish to donate any of their holdings and the park lacks authority to purchase, lease or otherwise acquire an interest in lands outside of park boundaries. Consequently, no nearby lands appear

to be feasible for the development of any of the needed park facilities.

Suitable rental buildings were all located too great a distance from the park to be considered feasible. Locating the administrative and maintenance operations here would cause a considerable decrease in the overall efficiency of park operations. Moreover, life cycle costs would be higher.

Detached Parcel. Constructing a new park administrative headquarters on the detached parcel or retrofitting the existing educational center/dormitory building for use as the park's administrative headquarters. This alternative was judged to have the least effect on park resources. However, constructing an administrative headquarters at another location on the detached parcel was judged to be not feasible as the three mile distance from the park would not contribute to more efficient and effective daily park operations.

Converting the existing dormitory into office spaces to house the existing park administrative operations was opposed by the superintendent, division heads, and staff because such use would eliminate the present important uses being made of the building. These include regular use by environmental education groups and by researchers working on park resource management issues. The building is also used for NPS training and by VIPs and participants in the park's annual cultural festival. Using lands on the detached parcel to construct the park's maintenance facilities was judged to be not feasible due to the physical distance and the lack of sufficient space.

Near the Visitor Center. Constructing the park's maintenance facilities on the level, graded area near the visitor center next to the dirt road leading to the picnic area. The site is centrally located, accessible and has already been disturbed. No surface cultural resources or natural resources are present. Moreover, the site is set back from the visitor center and with selected plantings could be screened off from the view of visitors. A closer, on-site examination of this location, however, revealed that the available space was too small to accommodate all the facilities required for the park's maintenance operation. Any expansion would entail extensive excavating into the nearby lava rock slope. More important, the noise and activities connected with the daily maintenance operations would intrude upon the interpretive activities going on at the nearby visitor center.

Alternative One (Proposed Action)

Construct new park administrative headquarters, maintenance facilities and comfort station to replace existing substandard and "temporary" shacks and sheds and portable chemical toilet units. Remove existing administrative and maintenance facilities and reestablish the historic scene at this location.

The park's proposed administrative headquarters building would be located adjacent to the entrance road (northeast) end of the existing visitor parking lot away from the visitor center. The site is both feasible and suitable: it is well above the flood hazard zone, near the main park

entrance and, consequently, easily accessible, and the proposed location at the entrance end of the parking lot will not affect activities at the visitor center located at the far end.

The proposed headquarters building would be screened with selected plantings so as not to be a visual intrusion. The ground surface here is gently sloping pahoehoe lava. The vegetation here is sparse and composed primarily of scattered weedy herbaceous alien species.

This general area was bulldozed before the national park was established and disturbed again during construction for visitor parking. The area was surveyed for the presence of cultural resources prior to the construction of the existing visitor parking lot. The park's 1964 archeological base map shows the presence of petroglyphs, papamu and two small structures in the immediate vicinity of the proposed construction site.

Recently (1999), a 100-foot by 140-foot area centered on the proposed footprint of the building was flagged and closely examined during a reconnaissance survey by the park archeologist. During the survey four papamu, 16 petroglyphs, an early trail and two stacked stone enclosures, identified as pig pens, were noted in the immediate vicinity. One of the platforms and the two structures are located just outside of the proposed footprint for the building.

It is proposed that the administrative headquarters be constructed above the ground on piles driven into the lava rock to minimize surface disturbance. No grading would be required. The proposed building would be connected to the existing parking lot by an elevated walkway ramp. Some of the existing visitor parking spaces would be marked and reserved for park employees. No expansion of visitor parking would be required. The existing parking is adequate for visitation levels in the foreseeable future.

The size requirements identified by the park for the proposed headquarters building are based on park operational requirements and the anticipated staffing level.

> Administrative Headquarters (approximately 2800 sf) to include office spaces for the superintendent, division chiefs, rangers, administrative and clerks, as well as a mail/file room, library/conference room, rest rooms, reception area, storage area, and mechanical/electrical spaces. The entire building would be air conditioned. Ten (10) parking spaces are needed next to headquarters for park staff, vendors, and deliveries. Existing spaces in the visitor parking lot would be signed and striped for these uses.

Proposed park maintenance facilities would be located at a site near (southwest) the existing sewage treatment plant in the mauka portion of the park. This area is presently accessible by an unpaved road. Although not centrally located, park maintenance staff judge that daily park operations could be efficiently and effectively carried out at this location.

This general area has already been disturbed by the earlier construction activities connected with the installation of the park's sewage treatment plant. Utilizing the park's 1964

archeological base map, the site proposed for the location of park maintenance facilities was examined. No cultural resources were noted at or near the proposed site on the base map.

During a recent (1999) reconnaissance level survey by the park archeologist, an assortment of previously unidentified sites was identified in the area. These features were noted and field mapped as general concentrations, including a variety of agricultural features such as pits enclosed by single stone alignments or low lying (two and three course) stacked walls, low terraces, pavements and stone alignments. The site location is presently covered by a dense stand of koa haole. An intensive survey and documentation of the site location would require removal of the vegetative cover.

The vegetation here is composed almost entirely of alien plant species, dominated by haole koa and with Guinea grass and mixed alien herbs. A few noni and `auhuhu (*Tephrosia purpurea*) are present nearby. The latter two are native species.

Sufficient space is available here for the park's entire maintenance operations. The existing ground surface, composed of pahoehoe lava, is rough and uneven and some pre-construction grading and site work would be required. Developments sited here would not be visible from the visitor center or the visitor parking lot.

Most of the existing service road leading to the sewage treatment plant is located outside of the park boundary. As noted, this road is a remnant of the old county road to Honaunau village. This road was long ago replaced by a new park entrance road built by the State. Hawaii County has informed NPS that they have acknowledged the abandonment of this road as a public highway and have surrendered fee title back to the original owner, Kamehameha Schools/Bishop Estate, as provided in the original transfer deed.

Trusteers of the Bishop Estate have approved the granting of an easement to permit the continuing use of this service road by NPS. In conjunction with the development of the maintenance facilities at the selected site, it is proposed that this road be paved to accommodate the daily use of park vehicles.

Size requirements identified by the park for the proposed maintenance facilities are based on operational requirements and anticipated staffing levels.

> Maintenance Facilities (approximately 3500 sf) to include a repair shop, workshop, file room, storage space for supplies and equipment, rest room (with showers and lockers), office spaces, fire cache and a covered garage (this structure needs to be high enough to accommodate the platform truck used for the trimming of coconuts). An air-handling system would be installed, including ceiling-mounted exhaust fans. Next to the maintenance facility, a secured storage yard with surrounding chain link fence is needed. Parking spaces for large vehicles would also be needed.

The new lift station and wastewater treatment facilities have been designed to accommodate the additional facilities proposed in this draft development concept plan. The proposed administrative headquarters building will require water, sewer, electrical and telephone. These new utilities would be installed in the same trench to be dug for the new lift station. For the proposed maintenance facilities, a new water line would need to be tied in to the existing water line. The new water line would run along the unpaved road. A new telephone line for the proposed facilities would be installed along the unpaved road from the proposed administrative headquarters building. The electrical line would run from the existing Civil Defense siren just outside the park. A new sewer line would have to be installed from the new sewage treatment area to the proposed maintenance facilities. Fire hydrants would be installed both at the proposed headquarters and at the proposed maintenance facilities.

Following construction of the new park headquarters building and maintenance facilities, the existing buildings housing these operations would be removed from their present location and this coastal area restored to its general appearance during the park's historic period.

The goal here is to reestablish the overall appearance of all historic resources including the landscape, archeological sites and their settings. Resource management would be a combination of preservation, stabilization, and rehabilitation. This process would be carried out first through the removal of the existing non-historic structures and alien vegetation followed by the selective planting of historic vegetation composed of native species and Polynesian introductions.

The existing structures were originally placed directly on top of the ground surface. Consequently, their removal would not involve any major disturbance of the subsurface. Any cultural features disturbed by the removal of the structures would be stabilized. Removal of existing structures would be monitored on-site by the park archeologist.

Historic records show much of this coastal area was barren of vegetation. Presently, the vegetation is a mix of alien species, including a number of planted ornamentals, and Polynesian introductions, with a few native species planted near the existing buildings. The yard surrounding the former housing unit contains a number of planted ornamentals, as well as several large kiawe trees, a large tamarind (*Tamarindus indicus*), loulu palm (*Pritchardia affinis*), and planted native hala trees (*Pandanus*).

The alien plants would be removed by manual uprooting and the selective use of herbicides. The few native species that have been planted in this area would be allowed to remain. The removal of aliens would be followed by the outplanting of selected native and Polynesian plants. These plantings would take place only if judged to be appropriate to this area as elements of the cultural landscape and not potentially damaging to archeological features. Native and Polynesian species appropriate for outplanting such as pua kala (*Argemone glauca*), noni (*Morinda citrifolia*), kou (*cordia subcordata*), naupaka kahakai (*Scaevola sericea*) and coconut palm (*cocos nucifera*) would be selectively planted or allowed to grow naturally in the

area.

The beach area just makai would continue to be used by visitors for picnicking and the shoreline for fishing. Development would be limited to the existing picnic tables and barbecue grills. No expansion of the picnic area is proposed. Vehicles used by picnickers, fishermen and beach users would continue to be permitted to access the coastal area via the existing unimproved road. No improvements would be made to this road and no tour buses would be allowed to use it.

This alternative calls for the removal of the existing portable chemical toilets. These would be replaced with a comfort station with flush toilets. Due to the proposed coastal

Figure 6. Proposed Park Headquarters, Maintenance Facilities and Comfort Station

location (See Appendix, Statement of Findings), wastewater would not be disposed of on site, but be pumped to the new sewage lift station. The proposed comfort station would be sized to accommodate visitors who utilize the nearby beach and shoreline area and would be designed to harmonize with the cultural landscape of this area of the park. A small lift station would be needed to pump wastewater from the comfort station to the new lift station near the visitor center. The stone wall enclosure is identified on the park's 1964 archeological base map. The site proposed for the new comfort station is near the picnic area and within an historic stone wall enclosure. The enclosure is currently being used by the park as a storage yard for stockpile of sand, soils and aggregates. A small frame supply shed is located within the enclosure.

Recently (1999), a reconnaissance survey of the interior of the enclosure was performed by the park archeologist, but a detailed examination of the surface was not possible at that time due to the stockpiles covering most of the ground surface within the enclosure. A reconnaissance survey was also conducted along the route proposed for utilities (water, electric and sewer) to connect with the lift station. Beyond the enclosure the conduit for the proposed utilities would run above ground. The ground surface here is pahoehoe lava. The proposed route runs in a northeasterly direction towards a section of stone wall, and from the stone wall in a northerly direction to the new lift station. From the stone wall to the new lift station the route of the proposed utilities would follow the route of the existing surface water and electrical conduits.

The park's 1964 archeological base map shows stone walls and enclosures in the area proposed for running utilities. The proposed route for utility conduits would parallel and then cross over the 1871 trail. During the recent reconnaissance survey numerous pavements and other small cultural features were noted.

Under this alternative, visitor services would continue to be provided at the present visitor center complex. The existing entrance road and entrance station, visitor parking, and visitor circulation and use patterns would remain unchanged.

Estimated Development Costs. The costs shown here are class "C" conceptual estimates. These estimates are based on square foot construction costs of similar types of NPS facilities from previous contract data. The estimates include indirect costs added to cover such things as design services, construction supervision, and other necessities. The following estimates also include adjustments to reflect the costs of construction on the island of Hawaii.

GROSS CONSTRUCTION COST ESTIMATES

	Gross Construction Costs	Construction Planning Costs	Total Project Costs
Administrative Headquarters			
Building (approx. 2800 sf)	$730,000	$62,000	$792,000
Mechanical/ Electrical	$103,000	$9,000	$112,000
Utilities	$132,000	$11,000	$143,000
Maintenance Facility			
Building (approx. 3500 sf)	$843,000	$71,000	$914,000
Mechanical/ Electrical	$129,000	$11,000	$140,000
Excavation & Grading	$134,000	$11,000	$145,000
Pave Parking & Storage Yard	$88,000	$7,000	$95,000
Fencing	$38,000	$3,000	$41,000
Utilities	$169,000	$14,000	$183,000
Pave Access Road	$108,000	$9,000	$117,000
Comfort Station			
Building (500 sf)	$170,000	$14,000	$184,000

Lift Station	$80,000	$6,000	$86,000
Utilities	$88,000	$7,000	$95,000

	Gross Construction Costs	Construction Planning Costs	Total Project Costs
Re-establish the Historic Scene			
Bldg. Demolition & (approx. 3200 sf) Site Restoration (approx. 2 acres)	$60,000	$5,000	$65,000
Total Estimated Costs	$2,872,000	$240,000	$3,112,000

Alternative Two (No Action)

This is the no action alternative, meaning the proposed action would not take place. The park's administrative headquarters and the maintenance facilities would continue to be located in a culturally significant coastal area subject to damage and inundation from storm waves. The daily activities connected with these park operations would continue to take place in this area. In sum, all those conditions described in the Purpose and Need section would continue. There would be no new developments and park facilities would continue to be located next to and on top of significant archeological sites and features.

ENVIRONMENTAL CONSEQUENCES

The environmental assessment section of this development concept plan analyzes the potential impacts on natural and cultural resources and the socioeconomic environment that would result from implementing the proposed action or the no action alternative.

ALTERNATIVE ONE (PROPOSED ACTION)

Calls for the construction of a new headquarters building next to the existing visitor parking lot, the construction of a new maintenance facility at a location near the existing sewage treatment plant, and the construction of a comfort station mauka of the coastal picnic area. The existing shacks and sheds housing the park's administrative headquarters and maintenance facilities would be removed from the culturally significant and coastal hazard area. Following removal, the historic scene would be restored in this coastal area. This is the environmentally preferred alternative.

Impacts on Natural Resources

Soils and Topography. Implementation of the proposed action would have a very minor and localized impact on soils and topography. Impacts would be confined to the sites proposed for the construction of the new facilities for the park's maintenance operations, the immediate area around these facilities and the proposed site of the new comfort station. There would be little impact on soils and topography from the construction of the proposed administrative headquarters building.

Site preparation for the construction of the maintenance facility would include some grading and minimal excavation of the rough and broken pahoehoe lava surface. Less than one acre of ground surface material would be disturbed by the actual construction and the staging area needed to support the construction. About 12,500 sf of ground surface would be covered and compacted by the construction of the proposed maintenance facilities and paved parking area. Construction related activities such as bringing building material, supplies and equipment on site would result in surface area disturbance somewhat beyond the actual construction site. This disturbance would be a temporary and would be mitigated following construction.

Major portions of the ground surface in this general area have already been disturbed by activities connected with the earlier construction of the sewage treatment plant and by the more recent installation of the septic tank and seepage beds to replace the sewage treatment plant.

No grading, excavation work, or other disturbance of the gently sloping pahoehoe lava surface other than the driving of the building support piles into the ground would be connected with the

construction of the new administrative headquarters building. Building supplies and materials would be stored nearby in an enclosed area within the existing paved visitor parking lot.

The new comfort station near the coast would require the disturbance of a small subsurface area nearby for the installation of a wet well and lift station. Utilities for the proposed comfort station would run mostly above ground and would not affect soils and topography.

Mitigation measures connected with soils would consist of instituting measures for the reduction of fugitive dust during excavation and grading activities. These measures would include sprinkling the construction site with water and covering any trucks hauling dirt and debris. All of these measures would be monitored by NPS staff.

Also, a clearing and grading plan would be required for the construction of the maintenance facilities to minimize disturbance. Areas accessed by heavy equipment would be limited and controlled by NPS staff or the contractor.

The removal of the existing shacks and sheds would have only very minor effects on soils and topography since these structures are raised up off the ground surface and lack foundations.

Air Quality. There would be minor, localized, and temporary adverse effects on the air quality occurring during construction activities from dust generated primarily from grading and secondarily from nitrogen oxides and reactive organic gas emissions generated from construction equipment. There would also be a minimal amount of dust generated during the demolition and removal of the existing facilities. This adverse effect would also be localized and temporary.

Water Resources. The proposed action would not have any long-term or short-term adverse effects on the quality of either the groundwater or the surface water within the park.

Wetlands. No wetlands would be affected by the proposed action.

Floodplains. No floodplains would be affected by the proposed construction. The proposed developments, except for the proposed comfort station, would be constructed outside of the identified flood hazard zone subject to inundation by 100-year floods and outside of the tsunami evacuation zone. Those park facilities now located within these zones would be removed.

Vegetation. Impacts on native vegetation by proposed construction would be very minimal. The construction of the new maintenance facilities is being proposed in an area where the vegetation has been disturbed by previous developments. Existing vegetation in the vicinity of the proposed maintenance facilities consists primarily of the alien plant ekoa or koa haole (*Leucaena leucocephala*) along with scattered patches of Guinea grass (*Panicum maximum*), another alien, and mixed alien herbs. Other than the ubiquitous `uhaloa (*Waltheria indica*), the

only native plant noted near this area during a recent survey was the Hawaiian moon flower (*Ipomoea tuboides*), located south of the proposed development. Noni (*Morinda citrifolia*) and `auhuhu (*Tephrosia purpurea*) occur in the vicinity of the proposed maintenance facilities, but the loss of a few plants would not impact their overall populations within the park. No threatened, endangered or candidate plant species would be affected by the construction of the proposed maintenance facilities.

Vegetation in and around the site for the construction of the proposed administrative headquarters building is minimal and consists of scattered alien grasses and herbaceous species. Species found in the vicinity include noni (*Morinda citrifolia*) and coconut palm (*Cocos nucifera*), both Polynesian introductions, along with aliens such Natal red top (*Melinis repens*), scarlet fruited passion flower (*Passiflora foetida*), blue-seeded portulaca (*Portulaca pilosa*), hairy spurge (*Chamaesyce hirta*), Flora's paintbrush (*Emilia* sp.) and coat buttons (*Tridax procumbens*). No native, threatened, endangered or candidate plant species would be affected by the construction of the proposed administrative headquarters.

The vegetation in and around the site proposed for the construction of the comfort station is nearly non-existent. Vegetation along route for utilities proposed to connect the comfort station with the sewage lift station consists of scattered noni and coconut palm. No threatened, endangered or candidate plant species would be affected by the construction of the proposed comfort station or the utility lines to connect it with the sewage lift station.

Following the removal of the non-historic structures from the coastal area, the alien plants present would be manually removed and selected native species and Polynesian introductions would be planted to reestablish the historic scene. Natives such as pua kala (*Argemone glauca*), milo (*Thespesia populnea*), kou (*Cordia subcordata*) and naupaka kahaiai (*Scaevola*) would be appropriate species. This would be a long-term beneficial effect.

Wildlife. No native wildlife would be affected by the proposed action. No threatened, endangered or candidate species of animals, reptiles, amphibians, insects, snails or arachnids would be affected by the proposed action.

Impacts on Visitor Use

Visitors would be little and temporarily affected by the activities connected with any of the proposed new construction. The construction of the proposed comfort station and the removal of existing facilities to allow for the reestablishment of the historic scene would cause short-term disruption to visitors picnicking or fishing along the nearby shoreline. This disruption would be mitigated by scheduling the construction, demolition and removal after park closure. The construction site would be clearly delineated--appropriate barriers, signs or fencing would be erected.

Activities connected with the construction of the administrative headquarters building would temporarily lower the quality of the visitor experience. Mitigation measures would include

fencing off those portions of the parking lot nearest the construction site. The construction site fenced area would be regularly monitored by NPS staff. Visitor access to and circulation patterns near the visitor center or the place of refuge would not be affected by any of the proposed construction of the administrative headquarters.

The construction of the new maintenance facilities is proposed in an area removed from visitor use. Consequently, there would be no effect on visitor use connected with the construction of the maintenance operation.

The overall quality of the visitor experience would be increased by the removal of administrative and maintenance facilities and portable chemical toilets from their present location and the subsequent reestablishment of the historic scene here. This would be a major and long-term beneficial effect.

Impacts on Park Operations

The proposed action would have a short-term adverse effect on park operations. There would a short-term disruption of the park's administrative, maintenance, and resource management activities following construction during the period when personnel, equipment, furniture, materials and park vehicles are moved from their existing location to the new sites.

Any construction materials and equipment required to remain on-site during non-work periods would be confined to a designated area and an enclosure fence would be installed with a locked entrance gate.

There would be no increases in management costs from the implementation of the proposed action. Park maintenance and resource management staff may have to go some additional distances in order to carry out their day-to-day activities. These are regarded as minor effects.

Impacts on Cultural Resources

The areas proposed for the development of a headquarters building and maintenance facilities have both been previously disturbed by bulldozing and by construction activities connected with the present visitor parking lot and the sewage treatment plant. Portions of the sites proposed for the development of the park's maintenance operations and the headquarters building were previously surveyed for the presence of cultural features prior to the installation of the sewage treatment plant in 1968-69. These surface surveys revealed no cultural sites or features. The location proposed for the construction of the comfort station has been disturbed by park maintenance and operation activities.

None of the three areas proposed for development would adversely affect any of the archeological sites or features identified on the park's 1964 archeological base map. However, the map does not include all of the previously recorded sites and features identified within park boundaries. Consequently, in connection with the preparation of this development concept plan, a reconnaissance level pedestrian survey was conducted in 1999 by the park archeologist

for all three of the areas proposed for development.

During the 1999 survey of the general area where construction of the park's maintenance facilities is proposed, an assortment of previously unrecorded sites and features were noted. The features appeared agricultural in nature and included low lying stacked stone walls, pits enclosed by single stone alignments, low terraces, pavements and stone alignments. The nearby cobblestone road was determined to be non-historic as it was constructed by NPS in connection with improving access to the Kahua Holua.

The subsurface disturbance during the minor excavation and grading required to construct the proposed maintenance facilities would be unlikely to reveal the presence of previously unknown archeological features since the ground surface here is composed of pahoehoe lava. However, prior to any disturbance of the subsurface the park archeologist would conduct a detailed on-site survey. The survey would be coordinated with the State Historic Preservation Officer.

During the recent surface survey of the site proposed for the administrative headquarters, a platform and two stacked stone enclosures (identified as pig pens) were noted by just outside of the site. These features were marked by NPS staff with flagging tape. No features were identified within the site proposed for the administrative headquarters.

The top several inches of the ground surface within the stone wall enclosure proposed for the comfort station have been heavily disturbed by a variety of park maintenance activities over the past several decades. No cultural resources were identified during the recent surface survey of the area within the enclosure.

A surface survey was also conducted in 1999 for the proposed route of the utilities (water, electric and sewer) to connect the proposed comfort station with the new lift station. Numerous pavements and other small features were scattered in the vicinity of the proposed route.

In summary, all three areas were closely examined for archeological, architectural and cultural landscape features. Features identified during the surveys were photographed along with photographic documentation of general site characteristics. During the surveys a variety of cultural sites and features were noted in and around each of the three areas proposed for development. Based on the surveys, the park archeologist concluded that, due to the high density of cultural sites and features within Pu`uhonua o Honaunau, it would be virtually impossible to select a potential development site that did not contain some assemblage of cultural resources.

The three sites proposed for development have been carefully selected to avoid impacting any of the park's primary or most significant cultural resources. A variety of methods would be utilized to minimize any impacts on cultural resources during construction, including design guidelines, vegetative screening and mitigation.

The existing administrative and maintenance facilities are located in an area containing cultural resources. Some of these resources--rock walls, house platforms, cairns--are located very close and in a few instances directly below the structures to be removed. During the demolition and removal of these non-historic structures, the potential exists for these resources to be disturbed or damaged. To avoid any damage or disturbance to cultural resources, a professional archeologist would be on-site during the removal period to direct and monitor these activities. Mitigation measures may include the screening or fencing off of the nearest cultural features to prevent them from being damaged.

The re-establishment of the historic scene here would have a long-term, beneficial effect on those cultural resources located in the coastal area. Moreover, through selective replanting, the cultural landscape of this area would be restored to its general appearance during Hawaiian times. This also would be a long-term beneficial effect. No park ethnographic resources would be affected by this alternative.

The State Historic Preservation Officer would be consulted prior to the removal of buildings and given the opportunity to be on site during the demolition and removal of the present administrative and maintenance facilities.

Impacts on the Historic Scene

The demolition and removal of the existing headquarters building and maintenance facilities would allow the entire area occupied by these structures to be restored to its general appearance during Hawaiian times. This would be a long-term, beneficial effect on the historic scene.

The NPS project supervisor would be on-site to monitor and oversee all clean-up activities following all construction. Tools, surplus materials rubbish, and debris would be removed prior to final inspection.

Socio-Economic Effects

The local socioeconomic climate of the surrounding area would not be affected by this alternative. There would be potential for short-term disturbance and disruption to some of the residents of the nearby village of Honaunau. During construction activities when equipment and material are being brought on site, residents of the nearby village of Honaunau could experience some temporary disruption of access and some minor increases in traffic and noise. These effects would be mitigated by coordinating and consulting with village residents. Construction activities would be scheduled during times when they would least affect village residents.

Unavoidable Impacts

Although new facilities are proposed in areas that have already been disturbed, where the vegetation is composed almost entirely of alien plant species and where no known cultural resources would be affected, land use here would be changed and could be returned to its

former condition only through removal of the proposed facilities. About one-acre of land and vegetation already disturbed would be unavoidably affected by the proposed developments near the sewage treatment plant.

Cumulative Effects

No known cumulative effects on the environment in the park or the region would result from the implementation of this alternative.

Conclusion

Major findings associated with implementing the proposed action consist of the following: a relatively small area already disturbed by earlier park development would be further disturbed by the construction of the park's maintenance facilities. This area is known to contain no significant cultural resources and no natural resources would be affected. The proposed maintenance facility would not affect either existing visitor use patterns or park operations. Minor, short-term adverse effects connected with proposed construction activities would be mitigated.

An important historic area of the park now being adversely affected by the presence of park facilities would be restored to its historic condition, the latter action made possible by the construction of replacement facilities in a non-historic area of the park. In summary, the proposed developments have long been judged to be needed improvements that, when constructed, would facilitate park operations, allow reestablishment of the historic scene in a portion of the park, and not significantly affect the park's cultural or natural resources.

ALTERNATIVE TWO (NO ACTION)

Under this alternative, the proposed action would not take place.

Impacts on Natural Resources

There would be no impacts on the park's soils and topography, air quality, vegetation or wildlife under this alternative.

Impacts on Visitor Use

Visitor use would not be affected.

Impacts on Park Operations

The park's administrative and maintenance operations would continue to take place in a coastal hazard area subject to damage from storm waves. Visitors and park staff would continue to use portable chemical toilets. The park would continue not to be in compliance with Director's Order #83: Public Health. These are all major long-term adverse effects.

Impacts on Cultural Resources

Those cultural features (Hawaiian rock walls and pens, house platforms, cairns) located next to

the existing park headquarters and maintenance buildings would continue to be adversely affected by presence of these non-historic structures as would the integrity of the historic scene here. These would be major adverse effects.

COMPLIANCE

The National Environmental Policy Act requires consideration of the environmental effects of proposed federal actions. In conjunction with the preparation of this draft development concept plan, an environmental assessment has been prepared to determine whether or not the potential for significant impact on the human environment exists. The environmental assessment also serves to provide public officials and members of the general public with the opportunity to review environmental information before any decisions are made and before any actions are taken on any proposed actions.

The proposed action consists primarily of (1) the relocation of the park's administrative headquarters and maintenance facilities to an area within the park where cultural resources, natural resources and the park's historic scene would not be affected and (2) the re-establishment of the historic scene in an area of the park where Hawaiian cultural resources are being adversely affected by the presence of the park's existing administrative headquarters and maintenance facilities.

Following public review of this document and the nature of the comments received, NPS will issue either a finding of no significant impact (FONSI) or a notice of intent (NOI) to prepare an environmental impact statement.

All of Pu`uhonua o Honaunau National Historical Park is listed as a National Register property. Consequently, all proposed actions must comply with section 106 of the National Historic Preservation Act, as amended. Under separate cover a cultural resource reconnaissance report has been prepared by the park archeologist to fulfill the compliance requirements as defined by section 106 and as specified in 36 CFR 800.

This report identifies and documents any cultural resource sites or features that are either potentially eligible for listing in the National Register of Historic Places or have been identified as contributing features to previously recorded National Register properties within Pu`uhonua o Honaunau National Historical Park. The report addresses archeological, architectural and cultural landscape features within the defined area of effect for the proposed development sites identified in this draft development concept plan.

The criteria of effect has been applied as specified in 36 CFR 800.5 and a determination been made that the proposed action would have no adverse effect on any significant cultural resource properties either associated with or located within the National Register boundaries of Pu`uhonua o Honaunau National Historical Park. A copy of this draft development concept plan/environmental assessment has been provided to the State Historic Preservation Office with a request for concurrence with the determination of no effect.

Section 7 of the Endangered Species Act, as amended, requires NPS to consult with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service to ensure that actions proposed in this draft development concept plan do not jeopardize the continued existence of listed species or critical habitat. Section 7 consultation was initiated when NPS contacted the U.S. Fish and Wildlife Service and the National Marine Fisheries Service in Honolulu, Hawaii to request review and comment on the draft plan.

Executive Order 11988, Floodplain Management, directs NPS to avoid, to the extent possible, the long and short-term impacts associated with modifying or occupying floodplains. A statement of findings has been prepared in connection with the comfort station proposed on the upper edge of the park's coastal flood hazard area.

CONSULTATION AND COORDINATION

Public involvement activity began in June 1997 when NPS planning and design professionals from the Pacific Island Support Office met with the park superintendent, division chiefs, and park staff to identify and discuss plan issues and concerns. The superintendent invited members of the local community to this meeting. Those attending providing the planning team with comments and support for the removal of park facilities from the historic coastal area.

NPS has sent out copies of this draft development concept plan/environmental assessment for public review, inviting comments from appropriate government agencies and all interested organizations and individuals.

The following agencies, organizations, and individuals have been sent copies of the draft document with a request for their review and comments.

U.S. Fish and Wildlife Service, Office of Ecological Services

National Marine Fisheries Service, Pacific Area Office

Historic Preservation Division, Department of Land and Natural Resources

Office of Hawaiian Affairs

Bishop Estate/Kamehameha Schools

Highways Division, Hawaii Department of Transportation, Hilo

Environmental Health Programs, Hawaii Department of Health, Hilo

Division of Forestry and Wildlife, Hawaii Department of Land and Natural Resources, Hilo

Planning Department, County of Hawaii

Planning Department, County of Hawaii, Kona Office

Deputy Managing Director, County of Hawaii, Kona

Director, Research and Development, County of Hawaii

Chairman, Na Hoa Pili Advisory Commission

Kona Hawaiian Civic Club

Kahua Na`au A`o ma PUHO, Inc.

McCandless Ranch & Cattle Company

Kealia Ranch

Herb Kane

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APPENDIX

STATEMENT OF FINDINGS, COASTAL HAZARD AREA PU`UHONUA O HONAUNAU NATIONAL HISTORICAL PARK

INTRODUCTION

Proposed Action

The proposed action, construction of a comfort station within the identified coastal flood hazard area, is part of proposals contained in the Development Concept Plan (DCP) being prepared for Pu`uhonua o Honaunau National Historical Park. The DCP calls for the removal of the park's administrative headquarters and maintenance facilities from the coastal hazard area and construction of new replacement facilities elsewhere in the park.

The flood hazard area where the construction of a comfort station is being proposed has been identified on National Flood Insurance Program map (Panel Number 155166-1166C), County of Hawaii, Department of Public Works. These maps are prepared by the Federal Emergency Management Agency. The proposed comfort station would replace three portable chemical toilet units located nearby and would consist of a 500 sf structure, a holding tank (wet well) and lift station. The future design of the structure will take into account its location within an area susceptible to damage from flooding and storm waves. Waste would be pumped regularly from the holding tank proposed adjacent to the comfort station to the park's sewage lift station located well outside of the coastal hazard area.

Site Description

The site proposed for the comfort station is located approximately 400 feet away from the park's shoreline and within a historic rock wall enclosure. The shoreline here consists of a spray/splash zone of bare pahoehoe lava backed by calcareous beach sand along a narrow strand and berm.

Mauka (inland side) of the sand berm is the park's picnic area. Mauka of the picnic area is an unimproved parking area for visitors and staff and an unpaved access road. The ground surface here is composed of a thin layer of coral sand covering a pahoehoe lava rock base. The vegetation consists of an open grove of planted coconut palms and a few large kiawe trees. The ground cover is mostly the native shrub, naupaka-kahakai (*Scaevola sericea*), and scattered alien herbaceous plants.

General Characteristics of the Nature of Flooding

The proposed comfort station would be within a coastal hazard area periodically susceptible to

the wash from high surf generated by severe winter storms, hurricanes or tsunami. Over the past two decades, the wash from waves generated by winter storms has reached this far up from the shoreline four times--in 1980, 1983, 1985 and 1986. During this same time period, the Kona coast of the island of Hawaii has been affected by two hurricanes, Iwa in 1982 and Iniki in 1993, but neither did any damage to this section of the park. No tsunami have hit this shoreline since 1960. None of the existing administrative or maintenance buildings have ever been damaged by storm waves, however, portable chemical toilet units were moved approximately 50 feet from their foundations during one of the storms. The DCP being prepared for the park proposes the removal of the existing administrative and maintenance buildings from this coastal area.

The location proposed for the comfort station, though within the coastal hazard area, would be inside of an historic rock wall enclosure. This enclosure has never sustained any major damage from storm waves and its structural integrity remains intact. Waste would be pumped from the comfort station to a higher elevation.

JUSTIFICATION FOR USE OF THE COASTAL HIGH HAZARD AREA

Why the Proposed Action Must Be Located Within the Coastal High Hazard Area

Rest room facilities are needed for the up to 2000 visitors/month who use the nearby coastal area--fishermen, picnickers and beach users. This particular portion of the park's coastline has been used by members of the local Hawaiian community for fishing and picnicking for many decades, going back to before Pu`uhonua o Honaunau was established as a unit of the national park system. Park management objectives call for supporting the continuation of these long-standing and traditional recreation opportunities (so long as there is no conflict between recreation use of the shoreline and the primary purpose of the historical park).

With the removal of the existing portable chemical toilets, replacement facilities need to be provided immediately and within a reasonable distance from the recreational users of the nearby shoreline area. Some of the fishing by members of the local community takes place at night.

Investigation of Alternative Sites

Alternative sites for the proposed comfort station were considered and rejected. The sites rejected were either (1) also located within the coastal hazard area, (2) in locations which would adversely affect cultural resources or (3) in locations which were not within a reasonable distance from users of the nearby shoreline. An additional consideration was until proposed permanent administrative and maintenance facilities can be completed outside of the coastal high hazard area, the proposed comfort station would also be used by park staff. The National Park Service has determined that the most practical alternative for locating the proposed comfort station is near the existing picnic area and the unimproved visitor parking lot.

DESCRIPTION OF SITE-SPECIFIC FLOOD RISK

Reoccurrence Interval of Flood Risk from Storm Wave Wash

As noted, there have been four times over the past twenty years when the wash from storm waves has swept over the area proposed for the comfort station. There have been no storms since 1986 severe enough to produce wave wash high enough to threaten even the picnic area makai (ocean side) of the proposed comfort station site. Hurricane Iniki did not generate storm waves of sufficient height along this particular stretch of coast to affect the picnic area, although it did affect other coastal portions of the park and damaged park resources. It is not possible to predict the reoccurrence interval of severe coastal storms or hurricanes at the location proposed for the comfort station. They will happen, but the frequency and severity of the occurrence is unknown at this time.

MITIGATION OF FLOOD RISK

Mitigation of Risk

Mitigation of risk to the comfort station would be achieved to a reasonable extent by locating the proposed structure within an existing historic rock wall enclosure that has withstood structural damage from previous storms and designing the comfort station to withstand damage from flooding or storm waves. The protection of human life would be achieved with warning and evacuation.

Time Required for Flooding to Occur/Opportunity for Evacuation

Warnings of approaching severe winter storms, hurricanes or tsunami are given well in advance by the National Weather Service and Hawaii County Civil Defense allowing for the evacuation of visitors, staff and valuable objects from the coastal portions of the park. The park is an official contact with the Hawaii County Civil Defense Agency. Through direct radio contacts the park is notified in the event of any approaching winter storms of a severe nature, and all hurricanes or tsunami. The park is provided with continually updated forecast information. Park evacuation plans are in place to ensure public safety. A civil defense siren is located just outside the park. Park staff members are trained and prepared to evacuate visitors on an emergency schedule. Evacuation procedures would be carried out only during the most severe storm conditions and in the event of any and all hurricanes or tsunami warnings.

CONCLUSION

The existing portable chemical toilets located near the coast need to be removed as soon as possible. There is no reasonable alternative location for the construction of a comfort station to serve the 2000/month recreation users of the nearby shoreline and park staff (so long as administrative and maintenance facilities continue to be located nearby). The comfort station would be designed so that wastewater is pumped up to the park's lift station located outside of the coastal hazard area. Plans are in place for evacuation of the park's coastal area in case of a

severe winter storm, hurricane or impending tsunami. Mitigative measures to minimize the potential for damage to the proposed comfort station include locating it within a rock wall enclosure that has withstood structural damage from previous storm waves. All state and local permits will be obtained prior to construction of the proposed comfort station.

RECOMMENDED: _____ _____
Superintendent Date
Pu`uhonua o Honaunau National Historical Park

CONCURRED: _____ _____
Water Resources Division Date
Washington Office

CONCURRED: _____ _____
Compliance Officer Date
Pacific West Region

CONCURRED: _____ _____
Safety Officer Date
Pacific West Region

APPROVED: _____ _____
Regional Director Date
Pacific West Region

[1.] Lands given to Hawaiians by the monarch as a Land Grant Award during the Great Mahele.